thickness 1000-4000 Å, preferably less than 2000 Å and most preferably around 1000 Å and is adjacent to first organic layer 603 comprising, e.g., PTCDA, PTCBI, or CuPc of approximate thickness 20-50 Å. A second organic layer 604 comprises, e.g., 4,4'-bis[N-(1-napthyl)-N-phenyl-amino]biphenyl (α-NPD), approximately 200-500 Å in thickness, and is adjacent to first organic layer 603. A third organic layer 605, comprising, e.g., aluminum *tris*(8-hydroxyquinoline) (Alq_3), approximately 200-500 Å in thickness, is adjacent to second organic layer 604 to form a rectifying heterojunction at the second organic layer 604 / third organic layer 605 interface. A fourth organic layer 606, comprising, e.g., CuPc, PTCBI, or PTCDA, of approximate thickness 20-50 Å is adjacent to third organic layer 605. Finally, second transparent electrode 607 is adjacent to the fourth organic layer 606 and comprises, e.g., ITO of approximate thickness 1000-4000 Å, preferably less than 2000 Å and most preferably around 1000 Å. In this embodiment, an extra pair of organic materials, here second organic layer 604 and third organic layer 605, selected to have appropriate relative mobilities and HOMO-LUMO offset for exciton ionization and charge separation is placed within a "sandwich" of two other organic materials, here first organic layer 602 and fourth organic layer 606. In this instance, the "inner" pair of organic materials, 604 and 605, provides the exciton ionization and charge separation and the "outer" pair, 603 and 606, serves both as charge transporting layers, i.e., transporting the separated carriers to the proper electrodes for substantially ohmic extraction, and as protective cap layers, i.e., protecting the inner pair of organic layers from damage during deposition and use. The outer pair of organic materials may be from the group consisting of CuPc, PTCDA, and PTCBI, or any two of the three may be used. That is, the same material or any combination thereof may be used for both contacts. Note, however, in embodiment 600, the interior pair of layers, 604 and 605, are preferably deposited so that the cathode side is on top so as to incorporate a low resistance cathode. However, as with the exemplary embodiment of Fig. 4A, the order of the deposition of the inner pair of organic materials is not critical electronically, though the order of the inner pair determines the polarity of the photosensitive optoelectronic device . Since the outer pair of organic layers is relatively thin, their electronic properties are of much less significance here than in the bilayer exemplary embodiment described herein above wherein the CuPc, PTCDA, and PTCBI also performed photoconversion and exciton ionization in